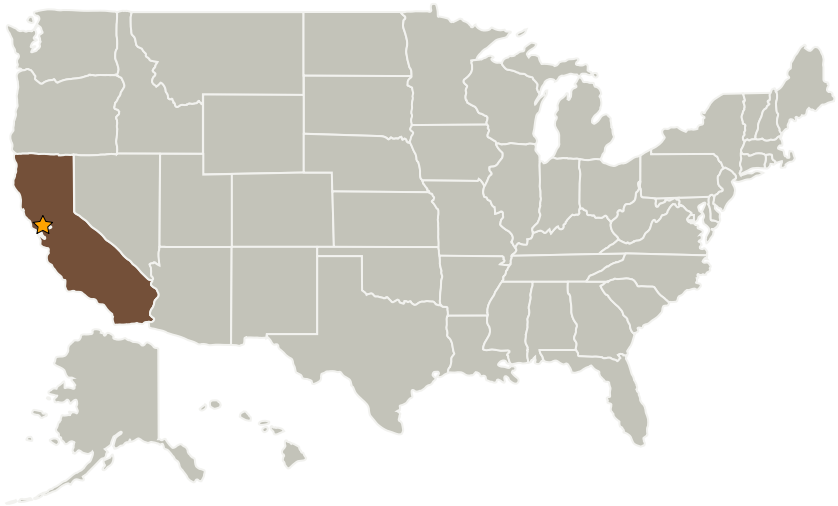
UAV Flight Instrumentation for the In-Situ Measurement of Aerosol Optical Properties, Phase I

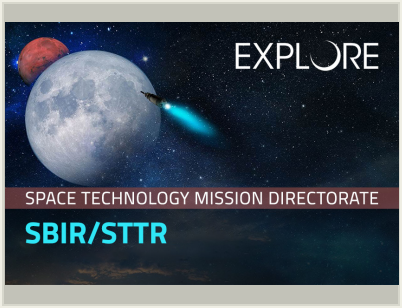
Completed Technology Project (2004 - 2004)

Project Introduction

Los Gatos Research, Inc. (LGR) proposes to develop a flight ready instrument, capable of deployment on unmanned aerial vehicles (UAVs) to simultaneously measure in situ aerosol extinction and scattering coefficients. The instrument will be lightweight, compact, robust, integrate into UAV platforms, and be capable of simultaneously measuring aerosol extinction and scattering coefficients to 0.1 Mm-1 with a 1 second sampling rate. This highly innovative instrument, based on cavity-enhanced laser spectroscopy, will operate autonomously, and continuously stream data for storage or downlink. By significantly increasing the speed, sensitivity, and accuracy of in situ aerosol optical property measurements this instrument will enhance NASA flight studies of atmospheric aerosols and their effects on the radiative balance of Earths atmosphere. These studies seek to identify how aerosol optical properties vary through the lower troposphere, and further determine under what conditions surface-based measurements of these properties be used to calculate the direct aerosol radiative forcing from a measured aerosol optical depth. These studies are also of great use in determining how in situ measurements compare to remote sensing measurements. The ability to gather in situ aerosol optical property data from UAV-based instrumentation will both complement and greatly enhance existing ground based and flight instrumentation.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Los Gatos Research	Supporting Organization	Industry	Mountain View, California

Primary U.S. Work Locations
California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Thomas Owano

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers